ABSTRACT OF THE DISCLOSURE

Accurate localization of sound in 3-D space is based on variations in the spectrum of sound sources. These variations arise mainly from reflection and diffraction effects caused by the pinnae and are described through a set of Head-Related Transfer Functions (HRTF's) that are unique for each azimuth and elevation angle. A virtual sound source can be rendered in the desired location by filtering with the corresponding HRTF for each ear. In this work, we provide an alternative approach, which uses a multiple-input single-output state-space system to create a combined model of the HRTF's for all directions. This method exploits the similarities among the different HRTF's to achieve a significant reduction in the model size with a minimum loss of accuracy.